angle. This will be understood from the fact that when $R = \infty$ and $\tan\theta_1 = n_2 (n_1 = 1)$ as a parameter of the Brewster angle are substituted for Equation 8, Equation 12 is obtained.

IN THE CLAIMS

Cancel claims 17-25 without prejudice or disclaimer, and add new claims 26-41, as follows:

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1 ~~26~~. (New) A solid-state laser comprising a laser cavity where pumping light is introduced into a gain crystal via a focusing lens and a dichroic concave mirror, wherein said focusing lens is tilted with respect to the optical axis of the pumping light so that a focusing point of the pumping light in a sagittal plane and a focusing point of the pumping light in a tangential plane in the gain crystal at least approximately coincide with focusing points in the respective planes in the gain crystal in a cavity mode;

wherein a focusing point of the pumping light is determined using a q-parameter defined by $\frac{1}{q_i} = \frac{1}{R_i} - j\frac{\lambda}{\pi w_i^2}$, where w_i is a beam radius at the position i, and R_i is the radius of curvature of a wave front at a position i;

a focal length of the focusing lens having a plano-convex shape is given by $f_{1s} = \dfrac{n_1 R_{focus}}{n_{2\_focus}\cos\theta_{2\_focus} - n_1 \cos\theta_{1\_focus}}$ for a sagittal plane, where n_1 is a refractive index of air or vacuum, n_{2_focus} is a refractive index of the focusing lens, R_{focus} is the radius of curvature of the focusing lens, θ_{1_focus} is the tilting angle of the focusing lens, and $\theta_{2\_focus} = \arcsin\left(\dfrac{n_1}{n_{2\_focus}}\sin\theta_{1\_focus}\right)$;

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a focal length of the focusing lens for a tangential plane is given by $f_{1t} = \dfrac{n_1 R_{focus}\cos^2\theta_{1\_focus}}{n_{2\_focus}\cos\theta_{2\_focus} - n_1 \cos\theta_{1\_focus}}$;

focal lengths f_{2s} and f_{2t} of the dichroic concave mirror for a transmitting light are given by

$$f_{2s} = \frac{n_1 R_{dichroic}}{n_{2\_dichroic}\cos\theta_{2\_dichroic} - n_1 \cos\theta_{1\_dichroic}}$$

$$f_{2t} = \frac{n_1 R_{dichroic}\cos^2\theta_{1\_dichroic}}{n_{2\_dichroic}\cos\theta_{2\_dichroic} - n_1 \cos\theta_{1\_dichroic}};$$

an ABCD matrix from an exit plane of the pumping light source to an arbitrary plane inside the gain crystal is given by $M_{17s} = \begin{pmatrix} A & B \\ C & D \end{pmatrix} = \begin{pmatrix} 1 & L_{56} + \dfrac{L_{67}}{n_{YAG}} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ -\dfrac{1}{f_{2s}} & 1 \end{pmatrix} \begin{pmatrix} 1 & t_{2s} + L_{34} + t_{1s} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ -\dfrac{1}{f_{1s}} & 1 \end{pmatrix} \begin{pmatrix} 1 & L_{12} \\ 0 & 1 \end{pmatrix}$ for the sagittal plane, where $t_{1s} = \dfrac{n_1}{n_{2\_focus}} L_{23}$, $t_{2s} = \dfrac{n_1}{n_{2\_dichroic}} L_{45}$, L_{23} is

the distance of the optical path inside the focusing lens, L_{45} is the distance of the optical path inside the dichroic mirror, L_{12} is the distance from the exit plane of the pumping light source to the focusing lens, L_{34} is the distance between the focusing lens and the dichroic concave mirror, L_{56} is the distance between the dichroic mirror and the gain crystal, and L_{67} is the distance between the end of the gain crystal and the arbitrary plane;

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the ABCD matrix M_{17t} from the exit plane of the pumping light source to the arbitrary plane inside the gain crystal is given by

$$M_{17t} = \begin{pmatrix} A & B \\ C & D \end{pmatrix} = \begin{pmatrix} 1 & L_{56} + \frac{L_{67}}{n_{YAG}} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ -\frac{1}{f_{2t}} & 1 \end{pmatrix} \begin{pmatrix} 1 & t_{2t} + L_{34} + t_{1t} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ -\frac{1}{f_{1t}} & 1 \end{pmatrix} \begin{pmatrix} 1 & L_{12} \\ 0 & 1 \end{pmatrix}$$ for

the tangential plane, where $t_{2t} = \frac{n_1 \cos^2 \theta_{1\_dichroic}}{n_{2\_dichroic} \cos^2 \theta_{2\_dichroic}} L_{45}$,

$t_{1t} = \frac{n_1 \cos^2 \theta_{1\_focus}}{n_{2\_focus} \cos^2 \theta_{2\_focus}} L_{23}$, and, if the gain crystal is cut at the Brewster angle, then n_{YAG} in M_{17s} is changed to n_{YAG}^3; and

the q-parameter at the arbitrary plane is given by

$q_7 = \frac{Aq_1 + B}{Cq_1 + D}$ and the arbitrary plane is a focusing point when Real $(1/q_7) = 0$ is satisfied.

2 ~~27~~. (New) A solid-state laser comprising:

(a) a laser cavity having a gain crystal and two end mirrors;

(b) a pumping light source for supplying pumping light to be led to the gain crystal;

(c) a dichroic concave mirror for introducing the pumping light to the gain crystal and constructing the laser cavity or deriving outgoing light; and

(d) a lens for focusing the pumping light on the inside of the gain crystal in the laser cavity,

wherein the focusing lens is tilted with respect to the optical axis of the pumping light so that the focusing point of the pumping light in a sagittal plane and that in a tangential plane in the gain crystal at least approximately coincide with the focusing points in the respective planes in the gain crystal in the cavity mode;

wherein a focusing point of the pumping light is determined using a q-parameter defined by $\frac{1}{q_i} = \frac{1}{R_i} - j\frac{\lambda}{\pi w_i^2}$, where w_i is a beam radius at the position i, and R_i is the radius of curvature of a wave front at a position I;

a focal length of the focusing lens having a plano-convex shape is given by $f_{1s}=\dfrac{n_1 R_{focus}}{n_{2\_focus}\cos\theta_{2\_focus}-n_1\cos\theta_{1\_focus}}$ for a sagittal plane, where n_1 is a refractive index of air or vacuum, n_{2_focus} is a refractive index of the focusing lens, R_{focus} is the radius of curvature of the focusing lens, θ_{1_focus} is the tilting angle of the focusing lens, and $\theta_{2\_focus}=\arcsin\left(\dfrac{n_1}{n_{2\_focus}}\sin\theta_{1\_focus}\right)$;

a focal length of the focusing lens for a tangential plane is given by $f_{1t}=\dfrac{n_1 R_{focus}\cos^2\theta_{1\_focus}}{n_{2\_focus}\cos\theta_{2\_focus}-n_1\cos\theta_{1\_focus}}$;

focal lengths f_{2s} and f_{2t} of the dichroic concave mirror for a transmitting light are given by

$$f_{2s}=\frac{n_1 R_{dichroic}}{n_{2\_dichroic}\cos\theta_{2\_dichroic}-n_1\cos\theta_{1\_dichroic}}$$

$$f_{2t}=\frac{n_1 R_{dichroic}\cos^2\theta_{1\_dichroic}}{n_{2\_dichroic}\cos\theta_{2\_dichroic}-n_1\cos\theta_{1\_dichroic}};$$

an ABCD matrix from an exit plane of the pumping light source to an arbitrary plane inside the gain crystal is given by $M_{17s}=\begin{pmatrix}A & B\\ C & D\end{pmatrix}=\begin{pmatrix}1 & L_{56}+\dfrac{L_{67}}{n_{YAG}}\\ 0 & 1\end{pmatrix}\begin{pmatrix}1 & 0\\ -\dfrac{1}{f_{2s}} & 1\end{pmatrix}\begin{pmatrix}1 & t_{2s}+L_{34}+t_{1s}\\ 0 & 1\end{pmatrix}\begin{pmatrix}1 & 0\\ -\dfrac{1}{f_{1s}} & 1\end{pmatrix}\begin{pmatrix}1 & L_{12}\\ 0 & 1\end{pmatrix}$

for the sagittal plane, where $t_{1s} = \frac{n_1}{n_{2\_focus}} L_{23}$, $t_{2s} = \frac{n_1}{n_{2\_dichroic}} L_{45}$, L_{23} is the distance of the optical path inside the focusing lens, L_{45} is the distance of the optical path inside the dichroic mirror, L_{12} is the distance between the exit plane of the pumping light source to the focusing lens, L_{34} is the distance between the focusing lens and the dichroic concave mirror, L_{56} is the distance between the dichroic mirror and the gain crystal, and L_{67} is the distance between the end of the gain crystal and the arbitrary plane;

the ABCD matrix M_{17t} from the exit plane of the pumping light source to the arbitrary plane inside the gain crystal is given by

$$M_{17t} = \begin{pmatrix} A & B \\ C & D \end{pmatrix} = \begin{pmatrix} 1 & L_{56} + \frac{L_{67}}{n_{YAG}} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ -\frac{1}{f_{2t}} & 1 \end{pmatrix} \begin{pmatrix} 1 & t_{2t} + L_{34} + t_{1t} \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ -\frac{1}{f_{1t}} & 1 \end{pmatrix} \begin{pmatrix} 1 & L_{12} \\ 0 & 1 \end{pmatrix}$$

for the tangential plane,

where $t_{2t} = \frac{n_1 \cos^2 \theta_{1\_dichroic}}{n_{2\_dichroic} \cos^2 \theta_{2\_dichroic}} L_{45}$, $t_{1t} = \frac{n_1 \cos^2 \theta_{1\_focus}}{n_{2\_focus} \cos^2 \theta_{2\_focus}} L_{23}$, and in addition, if the gain crystal is cut at the Brewster angle, then n_{YAG} in M_{17s} is changed to n_{YAG}^3; and

the q-parameter at the arbitrary plane is given by

$q_7 = \dfrac{Aq_1 + B}{Cq_1 + D}$ and the arbitrary plane is a focusing point when Real $(1/q_7)$ = 0 is satisfied.

3 ~~28.~~ (New) The solid-state laser according to claim ~~26,~~ / wherein the pumping light incident plane of the gain crystal is polished to have the Brewster angle or to be deviated from the right angle with respect to the optical axis of the cavity mode.

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4 ~~29.~~ (New) The solid-state laser according to claim ~~26,~~ / wherein the pumping light incident plane of the gain crystal is polished to have a right angle with respect to the optical axis of the cavity mode.

5 ~~30.~~ (New) The solid-state laser according to claim ~~26,~~ / wherein the tilting angle of the focusing lens is changed within a certain range around the predetermined tilting angle at which the focusing points of the pumping light in the sagittal and tangential planes in the gain crystal at least approximately coincide with the focusing points in the respective planes in the gain crystal in the cavity mode.

6 ~~31.~~ (New) The solid-state laser according to claim ~~28~~ 3, wherein the tilting angle of the focusing lens is changed within a certain range around the predetermined tilting angle at which the focusing points of the pumping light in the sagittal and tangential planes in the gain crystal at least approximately coincide with the focusing points in the respective planes in the gain crystal in the cavity mode.

7 ~~32.~~ (New) The solid-state laser according to claim ~~29~~ 4, wherein the tilting angle of the focusing lens is changed within a certain range around the predetermined tilting angle at which the focusing points of the pumping light in the sagittal and tangential planes in the gain crystal at least approximately coincide with the focusing points in the respective planes in the gain crystal in the cavity mode.

8 ~~33.~~ (New) The solid-state laser according to claim ~~26~~ 1, further comprising a plate for beam axis adjustment to be disposed between the pumping light source and the focusing lens.

9 ~~34~~. (New) The solid-state laser according to claim ~~27~~, 2 wherein the pumping light incident plane of the gain crystal is polished to have the Brewster angle or to be deviated from the right angle with respect to the optical axis of the cavity mode.

10 ~~35~~. (New) The solid-state laser according to claim ~~27~~, 2 wherein the pumping light incident plane of the gain crystal is polished to have a right angle with respect to the optical axis of the cavity mode.

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11 ~~36~~. (New) The solid-state laser according to claim ~~27~~, 2 wherein the tilting angle of the focusing lens is changed within a certain range around the predetermined tilting angle at which the focusing points of the pumping light in the sagittal and tangential planes in the gain crystal at least approximately coincide with the focusing points in the respective planes in the gain crystal in the cavity mode.

12 ~~37~~. (New) The solid-state laser according to claim ~~35~~, 10 wherein the tilting angle of the focusing lens is changed within a certain range around the predetermined tilting angle at which the focusing points of the pumping light in the

sagittal and tangential planes in the gain crystal at least approximately coincide with the focusing points in the respective planes in the gain crystal in the cavity mode.

13 ~~38~~. (New) The solid-state laser according to claim ~~34~~ 9, wherein the tilting angle of the focusing lens is changed within a certain range around the predetermined tilting angle at which the focusing points of the pumping light in the sagittal and tangential planes in the gain crystal at least approximately coincide with the focusing points in the respective planes in the gain crystal in the cavity mode.

14 ~~39~~. (New) The solid-state laser according to claim ~~27~~ 2, further comprising a plate for beam axis adjustment to be disposed between the pumping light source and the focusing lens.

15 ~~40~~. (New) The solid-state laser according to claim ~~27~~ 2, wherein the laser cavity comprises a gain crystal whose pumping light incident plane is polished to be normal to the optical axis of the cavity mode, a concave mirror, and a Littrow prism, and the pumping light incident plane of the

gain crystal and the plane opposite to a light incident plane of the Littrow prism serve as end mirrors.

14 ~~41~~. (New) The solid-state laser according to claim ~~27~~ 2, wherein the laser cavity comprises a dichroic concave mirror, a gain crystal, a concave mirror, and an end mirror, the pumping light incident plane of the gain crystal is polished to have the Brewster angle, and the pumping light enters the gain crystal via the dichroic concave mirror.

REMARKS

The Applicants request reconsideration of the rejection.

After cancellation of claims 17-25 above, and addition of new claims 26-41, claims 26-41 are pending.

Claims 26-41 have been written with an eye to the outstanding rejection under 35 USC §112, second paragraph. The Applicants believe that the Examiner's concerns have been fully addressed.

Claims 17-21 were also rejected under 35 USC §102(b) as being anticipated by Aoshima et al, US 5,815,519 (Aoshima). Without admitting to the propriety of the rejection, the